

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1- 4. Cancelled

5. (Currently Amended) A method for diagnosing impairments in a communication system, the method comprising:

accumulating statistical information about the impairments;

collecting a plurality of probability density functions corresponding to a signal-to-noise ratio of different combinations of the impairments and at least one signal line of the communication system;

creating a priori statistical models; and

updating the a priori statistical models using a posteriori statistical models of the impairments.

6. (Previously Presented) The method according to claim 5, wherein the impairments are external (out of domain) impairments.

7. (Previously Presented) The method according to claim 6, wherein the external impairments are AM interferences.

8. (Previously Presented) The method according to claim 6, wherein the external impairments are thermal impairments.

9. (Previously Presented) The method according to claim 6 further comprising detecting a signal to noise ratio change.

10. (Previously Presented) The method according to claim 6, wherein the communication system is a Digital Subscriber Line (DSL) system.

11. (Previously Presented) The method according to claim 5, wherein the impairments are internal (in domain) impairments.

12. (Previously Presented) The method according to claim 11, wherein the communication system is a Digital Subscriber Line (DSL) system.
13. (Previously Presented) The method according to claim 12 further comprising collecting statistical data about an aggregate signal-to-noise ratio of the communication system.
14. (Previously Presented) The method according to claim 13, wherein the statistical data about the aggregate signal-to-noise ratio of the communication system comprises a plurality of distinct probability density functions corresponding to the signal-to-noise ratio of different combinations of the internal impairments and at least one signal line of the DSL system.
15. (Previously Presented) The method according to claim 12 further comprising collecting statistical information about the aggregate power attenuation values.
16. (Previously Presented) The method according to claim 5 further comprising performing a statistical parameter estimation.
17. (Previously Presented) The method according to claim 5 further comprising performing a hypothesis test.
18. (Previously Presented) The method according to claim 1, wherein the communication system is a Digital Subscriber Line system.
19. (Currently Amended) A computer readable medium containing executable instructions which, when executed in a processing system, cause said system to perform a method comprising:
 - compiling statistical models of physical layers of a communication system;
 - collecting a plurality of probability density functions corresponding to a signal-to-noise ratio of different combinations of the impairments and at least one signal line of the communication system;
 - creating at least one a priori distribution;
 - storing the statistical models and the a priori distribution in a storage medium; and

diagnosing at least one impairment in the communication system using the statistical models and the a priori distribution.

20. (Currently Amended) A computer readable medium containing executable instructions which, when executed in a processing system, cause said system to perform a method for diagnosing impairments in a communication system, the method comprising:
- accumulating statistical information about the impairments;
 - collecting a plurality of probability density functions corresponding to a signal-to-noise ratio of different combinations of the impairments and at least one signal line of the communication system;
 - creating at least one a priori statistical model; and
 - updating the a priori statistical model using a posteriori statistical model of the impairments.
21. (Previously Presented) The computer readable medium according to claim 20, wherein the impairments are external (out of domain) impairments.
22. (Previously Presented) The computer readable medium according to claim 20 further comprising detecting a signal to noise ratio change.
23. (Previously Presented) The computer readable medium according to claim 20, wherein the impairments are internal (in domain) impairments.
24. (Previously Presented) The computer readable medium according to claim 23, wherein the communication system is a Digital Subscriber Line (DSL) system.
25. (Previously Presented) The computer readable medium according to claim 23 further comprising collecting statistical data about an aggregate signal-to-noise ratio of the communication system.
26. (Previously Presented) The computer readable medium according to claim 25, wherein the statistical data about the aggregate signal-to-noise ratio to the communication system comprises a plurality of distinct probability density functions corresponding to the signal-

to-noise ratio of different combinations of the internal impairments and at least one signal line of the DSL system.

27. (Previously Presented) The computer readable medium according to claim 23 further comprising collecting statistical information about the aggregate power attenuation values.
28. (Previously Presented) The computer readable medium according to claim 20 further comprising performing a statistical parameter estimation.
29. (Previously Presented) The computer readable medium according to claim 20 further comprising performing a hypothesis test.
30. (Currently Amended) An article of manufacture comprising a program storage medium readable by a computer and tangibly embodying at least one program of instructions executable by said computer to perform a method comprising:
- compiling statistical models of physical layers of a communication system;
 - collecting a plurality of probability density functions corresponding to a signal-to-noise ratio of different combinations of the impairments and at least one signal line of the communication system;
 - creating at least one a priori distribution;
 - storing the statistical models and the a priori distribution in a storage medium; and
 - diagnosing at least one impairment in the communication system using the statistical models and the a priori distribution.
31. (Currently Amended) An article of manufacture comprising a program storage medium readable by a computer and tangibly embodying at least one program of instructions executable by said computer to perform a method for diagnosing impairments in a communication system, the method comprising:
- accumulating statistical information about the impairment;
 - collecting a plurality of probability density functions corresponding to a signal-to-noise ratio of different combinations of the impairments and at least one signal line of the communication system;
 - creating at least one a priori statistical model; and

updating the a priori statistical model using a posteriori statistical models of the impairments.

32. (Previously Presented) The article of manufacture according to claim 31, wherein the impairments are external (out of domain) impairments.
33. (Previously Presented) The article of manufacture according to claim 31 further comprising detecting a signal to noise ratio change.
34. (Previously Presented) The article of manufacture according to claim 31, wherein the impairments are internal (in domain) impairments.
35. (Previously Presented) The article of manufacture according to claim 34, wherein the communication system is a Digital Subscriber Line (DSL) system.
36. (Currently Amended) The ~~method~~ article of manufacture according to claim 34 further comprising collecting statistical data about an aggregate signal-to-noise ratio of the communication system.
37. (Previously Presented) The article of manufacture according to claim 36, wherein the statistical data about the aggregate signal-to-noise ratio of the communication system comprises a plurality of distinct probability density functions corresponding to the signal-to-noise ratio of different combinations of the internal impairments and at least one signal line of the DSL system.
38. (Previously Presented) The article of manufacture according to claim 34 further comprising collecting statistical information about the aggregate power attenuation values.
39. (Previously Presented) The article of manufacture according to claim 31 further comprising performing a statistical parameter estimation.
40. (Previously Presented) The article of manufacture according to claim 31 further comprising performing a hypothesis test.